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GB 0752297 A FR 002248000 A US 5842493 A

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(54) Abstract Title

Wind resistant umbrella

(57) The umbrella includes strengthening strings 46 that extend from a strut 30 to an outer portion 24 of a multi-segmented rib 12. It also has vents (54, figure 3) that release air gusts, covered by an additional canopy (50, figure 3), or a central aperture (60, figure 4) that lets out the wind, covered by a sleeve (62, figure 4). The flexible cord 46 is attached to the struts 30 and ribs 12 by lugs 42 and 44.

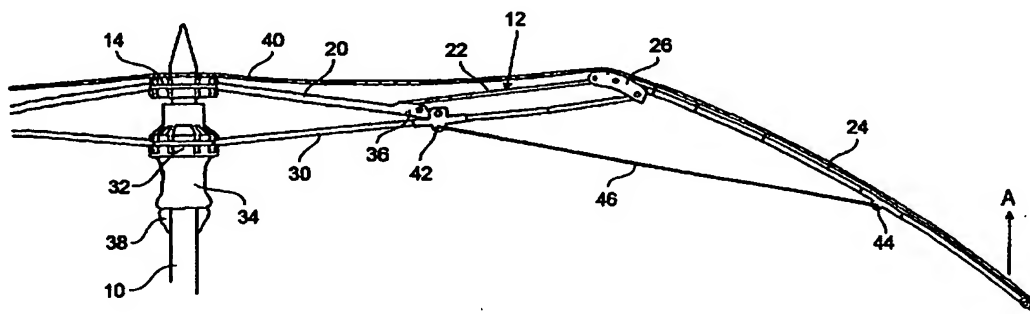


Fig 1.

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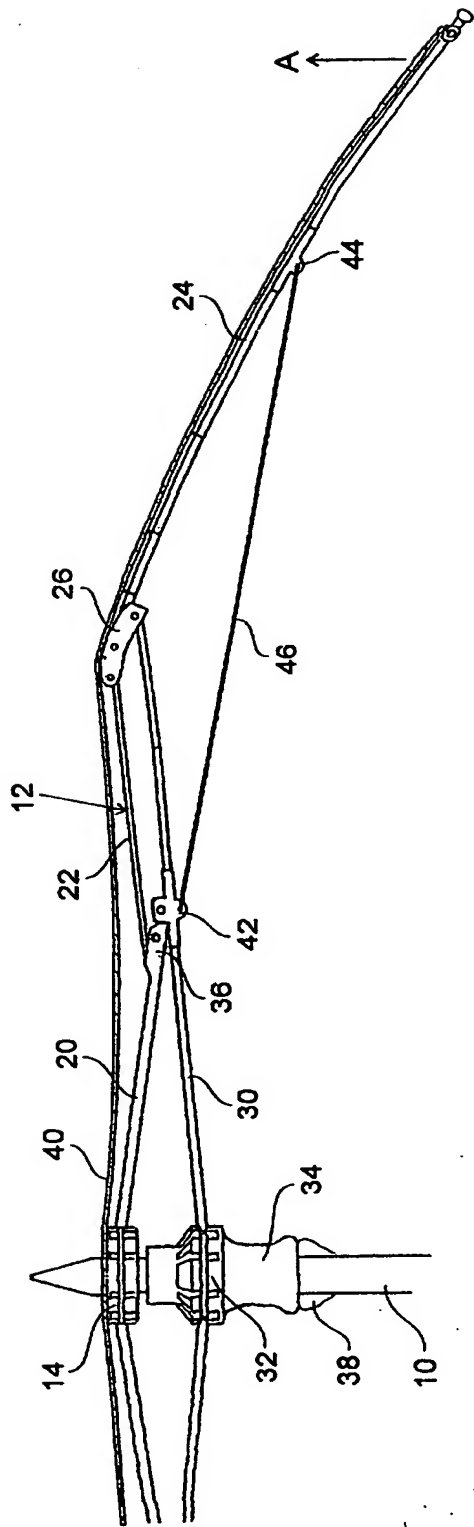


Fig 1.

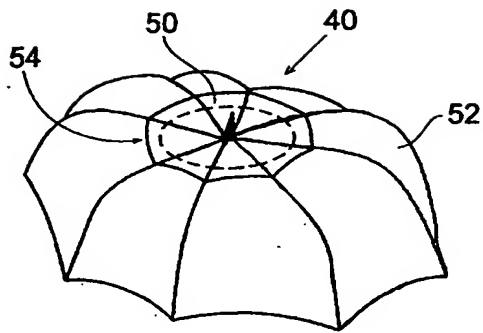


Fig 2.

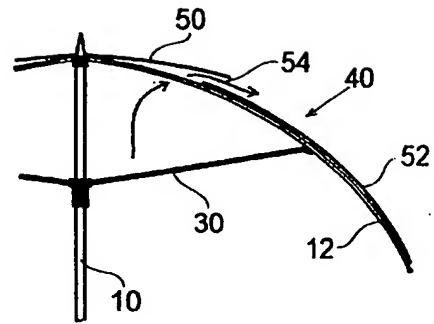


Fig 3

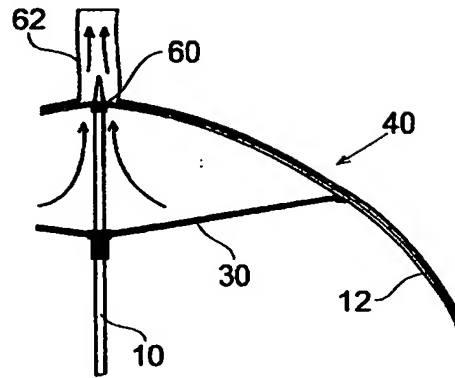


Fig 4

## UMBRELLAS

The present invention relates to umbrellas.

Conventionally, umbrellas comprise a series of radially extending ribs which are pivotally attached to a central pole and to which a waterproof cover is attached; and a series of struts pivotally connected between the ribs and a sleeve slidable on the central pole, so that the umbrella may be opened by sliding the sleeve towards the end of the central pole to which the ribs are attached and closed by sliding the sleeve away from the end of the central pole to which the ribs are attached. Detent means is provided for releasably retaining the sleeve in the open position.

In order to reduce the size of the umbrella when folded, the central pole may be telescopic and the ribs formed in two or three segments which are pivoted together. The struts are arranged to open the segments so that the ribs will be extended radially of the central pole, when the umbrella is open, and the cover is tight.

Umbrellas are subject to damage from being turned inside out, when subjected to gusts of wind from inside. This is particularly the case with umbrellas having segmented ribs, where the struts are required to run more parallel to the ribs in order to ensure proper deployment thereof, than with one-piece ribs.

The present invention relates to a modification to umbrellas which provides improved resistance to the ribs of the umbrella being turned inside out by a gust of wind.

According to one aspect of the present invention an umbrella comprises a central pole with a series of ribs pivotally attached to one end of the pole, struts interconnected between the ribs and a sleeve slidably mounted on

the central pole, so that movement of the sleeve towards the end of the pole to which the ribs are attached will cause the ribs to be extended radially outwardly and a cover secured to the ribs, flexible reinforcing elements being connected between an outer portion of each rib and the  
5 strut attached to that rib, the reinforcing element being connected to the rib and strut at a position spaced from the pivotal connection between the strut and rib, so that when the umbrella is open the reinforcing element will be under tension.

With the umbrella disclosed above, the reinforcing elements will withstand  
10 loads on the outer portions of the ribs tending to turn the umbrella inside out when subject to gusts of wind from inside the umbrella.

The flexible reinforcing elements are preferably in the form of wires or chords formed from material which will withstand the tensile loads to which they will be subjected.

15 According to a preferred embodiment of the invention, the ribs of the umbrella are multi-segmented, the segments of each rib being pivotally connected to one another and the struts being arranged to extend the segments when the umbrella is opened.

In addition to the reinforcing elements of the present invention, gust  
20 panels may be provided in the cover of the umbrella to provide further protection.

In accordance with one embodiment, the cover may be formed in two sections, an inner circular section and an outer annular section, the two sections being connected together in a manner such that the circular  
25 section overlaps the annular section with pockets formed therebetween, which will open to allow passage of a gust of wind from the inside of the

umbrella.

According to a further aspect of the present invention, a circular aperture may be provided at the centre of the cover, a sleeve of flexible material extending from the outer periphery of the circular aperture on the outside  
5 of the cover.

With this arrangement, in normal use, the sleeve will lie flat against the cover of the umbrella, closing the central aperture, so that the cover remains watertight. If however a gust of wind reaches the inside of the umbrella, the sleeve will balloon open allowing the gust to escape. In a  
10 preferred embodiment of this aspect of the invention, the sleeve may serve as a cover for the umbrella when it is folded.

The invention is now described, by way of example only, with reference to the accompanying drawings, in which:-

Figure 1 shows a part sectional elevation of an umbrella in accordance  
15 with the present invention, in its open position;

Figure 2 shows a perspective view of a modification to the umbrella illustrated in Fig. 1;

Figure 3 shows a part sectional elevation of the modified umbrella shown in Fig. 2; and

20 Figure 4 illustrates in part sectional elevation an alternative modification to the umbrella shown in Fig. 1.

As illustrated in Fig. 1, an umbrella comprises a central pole 10 having a series of radially extending ribs 12 pivotally attached to a hub formation

14 secured to the upper end of the pole 10. The ribs 12 are each formed in three segments 20, 22 and 24, the inner segment 20 being pivotally attached at its inner end to the hub formation 14 and adjacent its outer end to an intermediate segment 22. The intermediate segment 22 is pivotally connected at its outer end to an outer segment 24 via a link 26.

A strut 30 is pivotally mounted at its inner end to a hub formation 32 formed on a sleeve 34, the sleeve 34 being slidably mounted on the pole 10. The strut 30 is pivotally connected intermediate of its ends to an extension 36 of the segment 20 and at its outer end to the link 26, so that the extension 36, link 26, segment 22 and outer end of strut 30 form a parallelogram linkage.

The sleeve 34 is slidable on pole 10 from an open position as shown in Fig.1, in which the segments 20, 22 and 24 of the ribs 12 are in an extended position, the ribs 12 radiating outwardly from the pole 10; and a closed position in which the sleeve 34 is disposed downwardly of the position illustrated in Fig. 1 and segments 20, 22 and 24 of the ribs 12 are folded, the segments 20, 22 and 24 being disposed substantially parallel to the pole 10.

A retractable detent 38 is provided to retain the sleeve 34 in the open position illustrated in Fig.1.

A waterproof cover 40 is secured to the ribs 12 along the lengths of the outer segments 24 thereof.

Lugs 42 and 44 are provided intermediate of the ends of struts 30 and segment 24, respectively. A flexible reinforcing element 46, in the form of a length of wire or chord, is secured between the lugs 42 and 44, so that when the umbrella is opened and the segments 20, 22 and 24 of the

ribs 12 are extended, the reinforcing element 46 will be under tension.

The reinforcing element 46 thereby opposes movement of the outer segment 24 of the rib 12 in the direction of arrow A shown in Fig. 1; should the umbrella be subjected to a gust of wind from the underside.

5 The reinforcing elements 46 of the present invention will thereby withstand such gusts, inhibiting the umbrella from being blown inside out and the resulting damage thereto.

When the umbrella is closed, pivoting of the outer segments 24 towards the strut 30 will release tension in the reinforcing elements 46, allowing  
10 them to flex, so that the umbrella may be folded.

In the embodiment illustrated in Figs. 2 and 3, the cover 40 of the umbrella is formed in two sections, a central circular section 50 and an outer annular section 52. The outer periphery of the circular section 50 overlaps the inner periphery of the annular section 52, the two sections  
15 being secured together adjacent the outer periphery of the central section 50 and the inner periphery of the outer section 52, in a manner which will produce pockets 54, which will open when a gust of wind blows from inside the cover 40, thereby allowing the wind to escape.

The pockets 54 may be formed by tacking both the central and outer  
20 sections 50, 52 of the cover 40 to the ribs 12, where they overlie the ribs 12. Alternatively, the central section 50 may be attached adjacent its outer periphery to the inner periphery of the outer section, by an open material, such as netting, which will allow the passage of gusts of wind.

In the embodiment illustrated in Fig. 4, one or more apertures 60 are  
25 provided centrally of the cover 40. A sleeve 62 of waterproof flexible material is secured to the cover 40, so that it extends outwardly thereof and surrounds the outer periphery of the central aperture 60. With this



embodiment, in normal use the sleeve 60 will lay flat against the cover 40, closing the aperture 60 so that the cover remains waterproof. If however a gust of wind hits the inside of the cover 40, the sleeve 62 will balloon outwardly, allowing escape of the gust or wind through the  
5 central aperture 60.

The sleeve 60 may furthermore be turned inside out over the folded umbrella, to provide a cover for the umbrella when folded.

## CLAIMS

1. An umbrella comprising a central pole with a series of ribs pivotally attached to one end of the pole, struts interconnected between the ribs and a sleeve slidably mounted on the central pole, so that movement of  
5 the sleeve towards the end of the pole to which the ribs are attached will cause the ribs to be extended radially outwardly and a cover secured to the ribs, flexible reinforcing elements being connected between an outer portion of each rib and the strut attached to that rib, the reinforcing element being connected to the rib and strut at a position spaced from the  
10 pivotal connection between the strut and rib, so that when the umbrella is open the reinforcing element will be under tension.
2. An umbrella according to claim 1 in which the ribs of the umbrella are multi-segmented, the segments of each rib being pivotally connected to one another and the struts being arranged to extend the segments  
15 when the umbrella is opened.
3. An umbrella according to claim 2 in which the reinforcing elements are connected between the struts and the outer segments of the ribs.
4. An umbrella according to any one of claims 1 to 3 in which the  
20 reinforcing elements are wires or chords formed from material which will withstand the tensile loads to which they will be subjected.
5. An umbrella according to any one of the preceding claims in which lugs are provided on the struts and ribs for attachment of the flexible reinforcing elements.
6. An umbrella according to any one of the preceding claims in which  
25 gust panels are provided in the cover of the umbrella.

7. An umbrella according to claim 6 in which the cover of the umbrella comprises an inner circular section and an outer annular section, the outer periphery of the inner circular section overlapping the inner periphery of the outer annular section, the two sections being connected together in a manner which will form pockets therebetween, which will allow the passage of a gust of wind from the inside of the umbrella.

8. An umbrella according to claim 6 in which a circular aperture is provided at the centre of the cover, a sleeve of flexible material extending outwardly from the outer periphery of the circular aperture, on the outside of the cover.

9. An umbrella comprising a central pole with a series of ribs pivotally attached to one end of the pole, struts interconnected between the ribs and a sleeve slidably mounted on the central pole, so that movement of the sleeve towards the end of the pole to which the ribs are attached, will cause the ribs to extend radially outwardly, a cover secured to the ribs, a central aperture being provided in the cover, a sleeve of flexible material extending from the outer periphery of the circular aperture on the outside of the cover.

10. An umbrella substantially as described herein with reference to and as shown in Figs. 1 to 4 of the accompanying drawings.



INVESTOR IN PEOPLE

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**Claims searched:** 1-8 and 10

**Examiner:** Robert Black  
**Date of search:** 30 July 2001

## Patents Act 1977 Search Report under Section 17

### Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.S): A4P PKX, PGA, PKA, PRX, P102

Int Cl (Ed.7): A45B 25/22, 25/02

Other: Online: EPODOC; WPI; PAJ

### Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 752297 A (KORTENBACH) see whole document	1-4
X	FR 2248000 A (FULTON) see especially WPI abstract 1975-E7026W, figures 1, 8 and 9, and page 5 lines 6-9	1-5
A	US 5842493 A (YAKUBISIN) see especially figures 2 and 8	

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.